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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,155	07/25/2006	Hyung-Kwon Lim	118.24-US-WO	4993

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EXAMINER	
JOIKE, MICHELE K	
ART UNIT	PAPER NUMBER
1636	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/587,155	LIM ET AL.	
	Examiner	Art Unit	
	Michele K. Joike	1636	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 December 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3 and 4* is/are rejected.

7)☒ Claim(s) *5* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/17/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Receipt is acknowledged of a reply to the previous Office Action, filed December 17, 2009. Claims 1 and 3-5 are pending and under consideration in the instant application.

Any rejection of record in the previous Office Action, mailed August 17, 2009 that is not addressed in this action has been withdrawn. Because this Office Action introduces new rejections other than those set forth in the previous Office Action, and are not necessitated by amendment, this Office Action is **Non-Final**.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO01/19868 in view of WO 03/100020, Brake et al (PNAS 81: 4642-4646, 1984), Lee et al, Sanchez-Torres et al, US 7,270,969 and Osborne et al.

WO01/19868 (especially pages 1, 4-5, 8, 11-12 and SEQ ID NO: 7) teaches a vector comprising a T7 promoter, a LK8 cDNA sequence (SEQ ID NO: 7, which is the same sequence as SEQ ID NO: 1 in the current application), and a T7 terminator, in that order. It teaches that the vector can be from the pET series of vectors. The vector can be transfected into a cell. However, the reference does not teach use of the signal sequence SEQ ID NO: 2, that the promoter is a GAL1 promoter, or that the terminator is a CYC1 terminator. It also does not teach use of a delta sequence or neomycin gene.

Lee et al (Appl. Microbiol. Biotechnol. 48: 339-345, 1997, especially p. 339) disclose a delta-integration vector for the insertion of an inducible expression cassette and a bacterial neomycin resistance gene into the genome of *Saccharomyces cerevisiae* via homologous recombination; and a selection of the transformed cell containing integration by resistance to G418.

Sanchez-Torres et al (Appl Microbiol Biotechnol. 46(2):149-55, 1996, especially pp) teach use of a pET12a vector which contains a signal sequence. As evidenced by the plasmid map, the vector has the order of T7 promoter, signal sequence and then T7 terminator. There are restriction sites present after the signal sequence for insertion of the LK8 gene. The vector is similar to the pET15b vector used in WO01/19868, except pET12a has a signal sequence.

WO 03/100020 teaches SEQ ID NO: 24, which is an α-factor secretion signal sequence (SEQ ID NO: 2 of the current application).

US 7,270,969 (especially column 36) teaches use of the GAL1 promoter in S. cerevisiae.

Osborne et al (PNAS 86: 4097-4101, 1989, especially pp, 4097 and 4101) teaches use of the CYC1 terminator in S. cerevisiae.

The ordinary skilled artisan, desiring to construct a vector with a GAL1 promoter, an alpha-factor secretion sequence, a LK8 cDNA, a CYC1 terminator, a neo marker and a delta sequence would have been motivated to combine the above teachings because WO01/19868 teaches a vector with a promoter, a LK8 cDNA, a terminator, and US 7,270,969 teaches that the GAL1 promoter is a typical promoter suitable for expression in S. cerevisiae, and Brake et al teach that signal sequences allow for more efficient processing and secretion in yeast, and the alpha-factor efficiently secretes into the medium the mature biologically active protein, and Osborne et al teach that CYC1 acts as a terminator in S. cerevisiae, and is stable, with substitutions and deletions having little of no effect. Furthermore, Lee et al teach that direct integration into a host's genome is an effective way to introduce heterologous genes. It would have been obvious to one of ordinary skill in the art to make this vector because WO01/19868 teaches that LK8 gene showed anticancer effect by inhibiting the growth and the metastasis of a tumor and may be used as active ingredients of anticancer agents, and inserting it into a vector is an effective means for delivery, and the other parts of the vector, for example the GAL1 promoter, are well-known in the art and would give

predictable results when used. Given the teachings of the prior art and the level of the ordinary skilled artisan at the time of the applicant's invention, it must be considered, absent evidence to the contrary, that said skilled artisan would have had a reasonable expectation of success in practicing the claimed invention.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO01/19868 in view of WO 03/100020, Brake et al, Lee et al, Sanchez-Torres et al, US 7,270,969 and Osborne et al as applied to claims 1 and 3 above, and further in view of Kumar et al.

WO01/19868, WO 03/100020, Brake et al Lee et al, US 7,270,969 and Osborne et al teach all of the limitations as described above. However, they do not teach the use of the S. cerevisiae strain, BY4742.

Kumar et al (Yeast 20:857-863, 2003, especially pp. 857-859 and Table 1) teach BY4742 transformed with a vector.

The ordinary skilled artisan, desiring to construct a vector with a GAL1 promoter, an alpha-factor secretion sequence, a LK8 cDNA, a CYC1 terminator, a neo marker and a delta sequence and transform it into BY4742 would have been motivated to combine the above teachings with Kumar et al because Kumar et al teach that BY4742 is a widely used strain. It would have been obvious to one of ordinary skill in the art to use BY4742 because Kumar et al teach that BY4742 is MATα. Given the teachings of the prior art and the level of the ordinary skilled artisan at the time of the applicant's invention, it must be considered, absent evidence to the contrary, that said skilled

artisan would have had a reasonable expectation of success in practicing the claimed invention.

Response to Arguments Concerning Claim Rejections – 35 USC § 103 (a)

Applicant's arguments filed December 17, 2009 have been fully considered but they are not persuasive.

The following grounds of traversal are presented:

Applicants argue that none of the yeast alpha-secretion factor represented by SEQ ID NO: 2.

Applicant's arguments have not been found persuasive for the following reasons.

WO 03/100020 teaches SEQ ID NO: 24, which is an α-factor secretion signal sequence. It is the same sequence as SEQ ID NO: 2 of the current application.

Claims 1, 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cha et al in view of WO01/19868, WO 03/100020 and Brake et al.

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Cha et al (Biotech. and Bioprocess Eng. 9: 523-527, 2004, see entire paper) teach a MδLK8 vector that contains a GAL1 promoter, a MFα1 signal sequence, a LK8 gene and a CYC1 gene, in that order. It also teaches a delta sequence and a neo

marker. It also teaches the vector transformed into strain BY4742. However, it does not teach SEQ ID NO: 1 or 2.

WO01/19868 (especially pages 1, 4-5, 8, 11-12 and SEQ ID NO: 7) teaches a vector comprising a T7 promoter, a LK8 cDNA sequence (SEQ ID NO: 7, which is the same sequence as SEQ ID NO: 1 in the current application), and a T7 terminator, in that order. The vector can be transfected into a cell. However, the reference does not teach use of the signal sequence SEQ ID NO: 2.

WO 03/100020 teaches SEQ ID NO: 24, which is an α-factor secretion signal sequence (SEQ ID NO: 2 of the current application).

The ordinary skilled artisan would have been motivated to combine the above teachings because Cha et al teaches the MδLK8 vector containing the LK8 gene which produces an 86 amino acid protein, and the LK8 sequence taught by WO01/19868 would also produce an 86 amino acid protein. Furthermore, Brake et al teach that signal sequences allow for more efficient processing and secretion in yeast, and the alpha-factor efficiently secretes into the medium the mature biologically active protein. It would have been obvious to one of ordinary skill in the art to make this vector because Cha et al and WO01/19868 teaches that LK8 gene showed anticancer effect by inhibiting the growth and the metastasis of a tumor and may be used as active ingredients of anticancer agents, and inserting it into a vector is an effective means for delivery. Given the teachings of the prior art and the level of the ordinary skilled artisan at the time of the applicant's invention, it must be considered, absent evidence to the

contrary, that said skilled artisan would have had a reasonable expectation of success in practicing the claimed invention.

Allowable Subject Matter

Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michele K. Joike whose telephone number is (571)272-5915. The examiner can normally be reached on M-F, 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Low can be reached on (571)272-0951. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michele K. Joike/
Primary Examiner, Art Unit 1636

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